Mumbai University

Question Paper

April – 2013

[B.Sc.IT – Semester: VI]
(IDOL – Revised Course)

- ❖ **Internet Technologies**
- ❖ **Digital Signals and Systems**
- ❖ **IPR and Cyber Laws**
- ❖ **Geographic Information Systems**

Mumbai University

[IDOL – Revised Course]
(April – 2013)

PAPER - I

Internet Technologies

Time: 3 Hours   **Total Marks:** 100

N.B.: (1) *All Question are Compulsory.*
    (2) *Make Suitable Assumptions Wherever Necessary And State The Assumptions Made.*
    (3) *Answer To The Same Question Must Be Written Together.*
    (4) *Number To The Right Indicates Marks.*
    (5) *Draw Neat Labeled Diagrams Wherever Necessary.*
    (6) *Use of Non – Programmable Calculator is allowed.*

Q.1   ATTEMPT ANY TWO QUESTIONS: (10 MARKS)

(A)   Show the unabbreviated colon hex notation for the following IPv6 addresses: **(5)**
    (i) *An address with 64 0s followed by 64 1s.*
    (ii) *An address with 128 0s.*
    (iii) *An address with 128 1s.*
    (iv) *An address with 128 alternatives 1s and 0s.*
    (v) *An address with the alternative 1s and 0s.*

(B)   Explain the sum use of time exceeded message of ICMP.   **(5)**

(C)   Find the netid of the following IP address: **(5)**
    (i) *114.34.2.8* **(ii)** *132.56.8.6* **(iii)** *208.34.54.12*
    (iv) *251.34.98.5* **(v)** *129.14.6.8*

(D)   Describe 3 phases of communication between Remote Host & Mobiles Host.   **(5)**

Q.2   ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

(A)   Describe the functions of the Transport Layer in the OSI Model.   **(5)**
(B)   Explain the different kinds of classes along with their Network Mask for IPv4 addresses.   **(5)**
(C)   List the components of IP Package? Explain any one.   **(5)**
(D)   Explain the Transition Strategies from IPv4 to IPv6.   **(5)**
(E)   Explain the Transition Strategies from IPv4 addresses: **(5)**
    (i) *127.045.112.27*
    (ii) *12.24.35.7.8*
    (iii) *10110011.23.45.234*
    (iv) *76.27.256.23*
    (v) *A23.56.78.5*
(F)   Differentiate between IPv4 AND IPV6.   **(5)**

Q.3   ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

(A)   Explain the Source Quench Message and Time Exceeded Message in ICMPv4.   **(5)**
(B)   What is the inefficiency in Mobile IP? Give solution for it?   **(5)**
(C)   Explain the input module of ARP.   **(5)**
(D)   What are the three phases that a mobile host should go through to communicate with the remote   **(5)**
    host?
(E)   Explain the following terminologies related to OSPF Protocol: **(5)**
    (i) *Area*
    (ii) *Metric*
    (iii) *Link State Database*
(F)   Explain Path Vector Routing.   **(5)**

[TURN OVER]

Q.4   ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

(A) Explain Stop-and-wait Protocol and Go-Back-N Protocol in the Transport Layer.   **(5)**

(B) Explain the timers used in Transmission Control Protocol.   **(5)**

(C) Explain the features of Stream Control Transmission Protocol.   **(5)**

(D) List the multiple byte options supported by TCP. Explain any one with proper example.   **(5)**

(E) Explain the two-node loop problem of distance vector routing. Give the solution of it.   **(5)**

(F) A TCP connection is in ESTABLISHED.   **(5)**
     The following events occur one after another:
  (i)   *A FIN Segment is received.*
  (ii) *The applications sends a "close" message.*

Q.5   ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

(A) Explain the DHCP Client Transition diagram.   **(5)**

(B) What are the types of records used in Domain Name System?   **(5)**

(C) What is mean by resolution in DNS? Explain.   **(5)**

(D) What are the types of TPTP Message? What is the purpose of each one?   **(5)**

(E) Define and give example of the following: **(5)**
  • *Fully Qualified Domain Name.*
  • *Partially Qualified Domain Name*

(F) List any five file management commands of FTP and write their purpose.   **(5)**

Q.6   ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

(A) Write a note on POP3.   **(5)**

(B) Explain the user agent component of Electronic Mail System.   **(5)**

(C) What are the types of Web documents?   **(5)**

(D) What is the concept of SMI in SNMP?   **(5)**

(E) What are the different kinds of headers available in MIME?   **(5)**

(F) Write a short note on cookies.   **(5)**

Q.7   ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

(A) Write a TCP Server program to find the whether number sent by client is prime or not.   **(5)**

(B) Write a TCP Server application to find reverse of the given string.   **(5)**

(C) Differentiate between TCP and UDP.   **(5)**

(D) Write a short note on Concurrent Connectionless Programming.   **(5)**

(E) Write a UDP Server code to find whether given string is palindrome or not.   **(5)**

(F) Write a UDP Server code to find factorial of a number.   **(5)**

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Question Paper

[IDOL – REVISED COURSE]
(APRIL – 2013)

PAPER - II

DIGITAL

SIGNALS AND SYSTEMS

Time: 3 Hours   **Total Marks:** 100

N.B.: **(1)** *All Question are Compulsory.*
     (2) *Make Suitable Assumptions Wherever Necessary And State The Assumptions Made.*
     (3) *Answer To The Same Question Must Be Written Together.*
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     (5) *Draw Neat Labeled Diagrams Wherever Necessary.*
     (6) *Use of Non – Programmable Calculator is allowed.*

Q.1 **ATTEMPT ANY TWO QUESTIONS: (10 MARKS)**

(A) What is signal processing? What is Digital Signal Processing?   **(5)**
(B) State and explain Inverse Laplace Transform.   **(5)**
(C) State any five properties of z-Transform.   **(5)**
(D) What is Digital Filter? State the advantages of Digital Filters.   **(5)**

Q.2 **ATTEMPT ANY THREE QUESTIONS: (15 MARKS)**

(A) Discuss advantages of Digital Signal Processing (DSP) over Analog Signal Processing (ASP). **(5)**
(B) What is Even and ODD Signal? Determine even and odd components of $x(t) = \cos t + \sin t$. **(5)**
(C) Write note on Quantization.   **(5)**
(D) State and prove Parseval's theorem.   **(5)**
(E) Any five Properties of Fourier transform.   **(5)**
(F) Explain Dirichlet's conditions.   **(5)**

Q.3 **ATTEMPT ANY THREE QUESTIONS: (15 MARKS)**

(A) Laplace transform of t $\sin at$.   **(5)**
(B) Properties of Laplace Transform.   **(5)**
(C) Final Value theorem in Laplace transform.   **(5)**
(D) Laplace transform of Cosine function.   **(5)**
(E) Laplace transform for Impulse Response of Series R-C Circuit.   **(5)**
(F) Region of Convergence of Laplace transform.   **(5)**

Q.4 **ATTEMPT ANY THREE QUESTIONS: (15 MARKS)**

(A) Explain Z-Transform?   **(5)**
(B) Determine the convolution of the two sequences $x(n) = \{2,1,0,0,5\}$ and $h(n) = \{2, 2, 1, 1\}$ **(5)**
(C) Explain Final Value Theorem.   **(5)**
(D) Explain z-Transform.   **(5)**
(E) Z-Transform of $x(n) = 2^n u(n - 2)$ **(5)**
(F) Important properties of the ROC for the z-Transform.   **(5)**

Q.5 **ATTEMPT ANY THREE QUESTIONS: (15 MARKS)**

(A) $F[x(n)] = [x(n)]^2$ **(5)**
(B) Explain Linearity.   **(5)**
(C) Show that the system described by the differential equation $\frac{dy(t)}{dt} + 10y(t) = x(t)$ is non-linear. **(5)**
(D) NA   **(5)**
(E) Solve: $y(n) = ax(n) + b$ **(5)**
(F) Explain Frequency Response.   **(5)**

[TURN OVER]

Q.6 **ATTEMPT ANY THREE QUESTIONS: (15 MARKS)**

(A) Given $x(n) = \{0, 1, 2, 3, 4, 5, 6, 7\}$, $find$ $X(k)$ using DIT FFT Algorithm. **(5)**

(B) Relationship of the DFT to the z-transform. **(5)**

(C) Find the N-Point DFT for $x(n) = a^n$ for $0 < a < 1$. **(5)**

(D) NA **(5)**

(E) NA **(5)**

(F) NA **(5)**

Q.7 **ATTEMPT ANY THREE QUESTIONS: (15 MARKS)**

(A) NA **(5)**

(B) NA **(5)**

(C) NA **(5)**

(D) NA **(5)**

(E) Explain Elliptic Filters. **(5)**

(F) Determine the unit sample response of the ideal low pass filter. Why is not realizable? **(5)**

MUMBAI UNIVERSITY

QUESTION PAPER

DIGITAL SIGNAL AND SYSTEMS

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B.Sc.IT

(SEMESTER – VI)

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<u>Question Paper</u>

[IDOL – Revised Course]
(April – 2013)

PAPER - IV

ELECTIVE

IPR AND

CYBER LAWS

Time: 3 Hours   **Total Marks:** 100

N.B.: (1) *All Question are Compulsory.*
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Q.1   ATTEMPT ANY TWO QUESTIONS: (10 MARKS)

(A)   What is E-Governance? Explain.   (5)
(B)   What are the issues of Copyrights in Digital Media? How they are addressed?   (5)
(C)   Explain the need of Cyber Law and Cyber Security.   (5)
(D)   What does IT Act, 2000, "Attribution, Acknowledgement and Dispatch of Electronic Records" cover?   (5)

Q.2   ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

(A)   Explain the concept of Intellectual Property Rights.   (5)
(B)   What is a Copyright? What are its characteristics?   (5)
(C)   What is Patent? What do you understand by Patent Law? Explain the features of Patent Law.   (5)
(D)   What is a Trademark? What are its Functions?   (5)
(E)   Enlist the Basic Principles of Design Rights.   (5)
(F)   Discuss "International Background of Intellectual Property Rights".   (5)

Q.3   ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

(A)   Explain protection of Copyrights.   (5)
(B)   How is data protection enforced? Explain.   (5)
(C)   Discuss "Domain Name as Intellectual Property".   (5)
(D)   Illustrate defences with respect to Computer Software as Intellectual Property.   (5)
(E)   State and explain Semiconductor IC Layout Design Act.   (5)
(F)   Write short note on WIPO Treaty.   (5)

Q.4   ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

(A)   What are the defences available in Case of infringement of Trademarks?   (5)
(B)   Explain different Rights conferred by Copyright?   (5)
(C)   What are the defences available in case of infringement of Designs?   (5)
(D)   What are essential factors for infringement of Trademark?   (5)
(E)   Write short note on infringement of Design.   (5)
(F)   Explain the transfer of Patent rights in the form of assignment.   (5)

Q.5   ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

(A)   What are general obligations for enforcement of Intellectual Property Rights?   (5)
(B)   Discuss Civil Remedies in enforcing Intellectual Property Rights.   (5)
(C)   Explain the advantages and disadvantages of IP Licensing.   (5)
(D)   Explain practical aspects of Licensing.   (5)
(E)   Explain the Criminal Remedies in enforcing Intellectual Property Rights.   (5)
(F)   What is Licensing Agreement? List its different types.   (5)

[TURN OVER]

Q.6   ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

(A)   Explain the conditions for applying Digital Signature.   **(5)**

(B)   Explain Cryptography in Digital Signature.   **(5)**

(C)   What are the Privacy issues for Data and Software? Explain.   **(5)**

(D)   What is Cybercrime? Explain different types of Cybercrimes.   **(5)**

(E)   Explain Hyperlinking in Website. What are the various issues related to Hyperlinking?   **(5)**

(F)   Explain the concept of Patent in Cyber World.   **(5)**

Q.7   ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

(A)   What does IT Act, 2000, "Penalties and Adjudication" cover? Explain.   **(5)**

(B)   What is Cyber Appellate Tribunal? What are its Powers?   **(5)**

(C)   Discuss some of the offenses and punishments covered in IT Act 2000?   **(5)**

(D)   What does IT Act, 2000, "Miscellaneous" talk about? Explain.   **(5)**

(E)   Explain Cyber Law issues in E-Business Management.   **(5)**

(F)   List the issues in Cyber Evidence Management.   **(5)**

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(April – 2013)

PAPER - IV

ELECTIVE

Geographic

Information

System

**Time:** 3 Hours   **Total Marks:** 100

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Q.1   ATTEMPT ANY TWO QUESTIONS: (10 MARKS)

(A) Describe the four types of Map Projection by preserved property.   **(5)**
(B) Explain the Neighborhood Operations with suitable example.   **(5)**
(C) Explain Map-To-Map Transformation.   **(5)**
(D) Write the Adjacency Matrix for the following Diagraph.   **(5)**
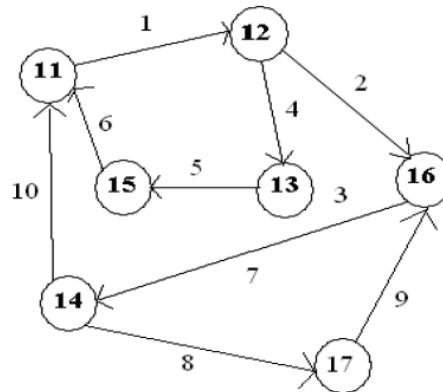
Q.2   ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

(A) Explain the State Plane Coordinate System with suitable example.   **(5)**
(B) List and explain the Map Projection Parameters.   **(5)**
(C) Draw a Quad Tree for the following: **(5)**
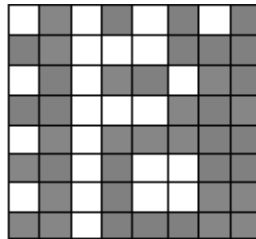
Also Code the Spatial Index of the Shaded Feature.
(D) Explain the Region Data Model with suitable example.   **(5)**
(E) Explain Cell-By-Cell Encoding with suitable example.   **(5)**
(F) Write a short note on TIGER.   **(5)**

Q.3   ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

(A) What is Metadata? Explain.   **(5)**
(B) Explain Digitizing with suitable example.   **(5)**
(C) Explain Affine Transformation.   **(5)**
(D) List and explain various Resampling Methods with suitable example.   **(5)**
(E) What is the role of Control Points in Affine Transformation? Give suitable example.   **(5)**
(F) Explain the concept of Scanning.   **(5)**

[TURN OVER]

Q.4   ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

(A)   Explain the two types of Attribute Table.   (5)

(B)   <u>Define the following terms:</u>   (5)
   (i) *Categorical Data*
   (ii) *Feature Attribute Table*
   (iii) *Numeric Data*
   (iv) *Interval Data*
   (v) *Primary Key*

(C)   Explain Network Database with suitable example.   (5)

(D)   What is Normalization? What are the objectives of Normalization?   (5)

(E)   Explain the Join and Relate Operations of tables in Relational Database.   (5)

(F)   Write a short note n Map Production.   (5)

Q.5   ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

(A)   Write a short note on Data Visualization.   (5)

(B)   What are the different types of graphs used for Data Exploration?   (5)

(C)   Explain Cumulative Distribution and Scatterplot types of graph with suitable example.   (5)

(D)   What is the output of the following for a statement (slope = 2) OR (NOT(Aspect =1))   (5)

(E)   Explain Spatial Aggregation and Data Classification.   (5)

(F)   Describe brushing as a Technique for Data Exploration.   (5)

Q.6   ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

(A)   Describe variations in Buffering.   (5)

(B)   List and explain various Overlay Operations based on Boolean Connector.   (5)

(C)   What are the applications of Overlay?   (5)

(D)   Explain Spatial Autocorrelation with example.   (5)

(E)   Explain the following Map Manipulation Operations with example.   (5)
   (i) Append (ii) Split

(F)   Find the Zonal Mean for the input raster(a) using a zonal raster(b)   (5)

2	7	1	1		1	1	1	2
9	8	5	3		1	1	1	2
2	8	4	6		3	3	2	2
1	4	5	3		3	3	3	3

         (a)   **(b)**

Q.7   ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

(A)   List Global Methods and explain any one.   (5)

(B)   Describe how Semivariance can be used to qualify the spatial dependence in a Data Asset.   (5)

(C)   Explain the Density Estimation Local Method.   (5)

(D)   Explain Universal Kriging.   (5)

(E)   Write a short note on Spatial Interpolation.   (5)

(F)   Explain the use of binning process used in Kriging.   (5)